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211/154

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ARCS Field Equipment

Preliminary bench checks were made on the two ARCS Field Units to determine the operating condition and frequency characteristics at the time of receipt from SAC.

Transmitting and receiving frequencies:

<u>Receiver Channel</u>	<u>Crystal Frequency</u>	<u>Receiver Frequency</u>

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<u>Transmitter Channel</u>	<u>Crystal Frequency</u>	<u>Transmitter Frequency</u>

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Unit 1

Transmitter power output:

<u>Channel</u>	<u>I_A</u>	<u>E_A</u>	<u>R</u>
1	1.3A	85V	26 ohms
2	0.75	95	36
3	1.0	130	36
4	1.05	170	36

Receiver 10 db S/N sensitivity:

<u>Channel</u>	<u>Raw Noise, MV</u>	<u>10 db S/N, MV</u>
1	0.007 MV	6.5 MV
2	0.01	9.2
3	0.01	12.0
4	0.007	7.0

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ORIG CLASS 5 PAGES 4 REV CLASS C
JUST 22 NEXT REV 2010

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Unit 2

Transmitter power output:

No tests were made because of a defective high voltage power supply.

Receiver 10 db S/N sensitivity:

<u>Channel</u>	<u>Raw Noise, MV</u>	<u>10 db S/N, MV</u>
1	0.01 MV	4.0 MV
2	0.015	7.5
3	0.01	9.0
4	0.01	10.0

Observations

1. The high voltage power supply seems to be the unit most susceptible to breakdown. Complete breakdown of the thyrite resistors in the voltage limiting circuit of the power supply in unit #1 could not be traced to faulty operation of any other parts of the circuit. The failure of the resistor material is believed to have been caused by operating the transmitter under no-load conditions thereby drawing excessive current through the voltage limiting circuit. Since the output of the transmitter is an on-off voltage pulse, the voltage limiting circuit is required to control the no-load voltage between pulse outputs; but is not designed for continuous no load operation. This theory has been confirmed by []

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2. The primary batteries furnished [] as spares for the Field Units were found to be slightly larger in size than the batteries contained in the unit. Considerable difficulty was experienced in removal and replacement of these batteries in the battery compartment of the field unit. Larger bend radii were evidently used in the manufacture of the spare battery cases causing them to be approximately three-thirty-sec. larger than the originals.

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The cells of the spare batteries were not connected in the same sequence as the originals. As a result the spare batteries have to be rewired to maintain the proper polarity.

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3. The results of the tests on the transmitter of Unit #1 indicate that the transmitter is in satisfactory operating condition on all four channels. No on-the-air measurements of the power output were made; but with a purely resistive load, the power output was as indicated in the transmitter power output table. Since the antenna loading network and power output tank circuit had been adjusted to load into the antenna, some mismatch will be present with a resistive load. Greater output is expected when the antenna is used as the load.

4. The noise that the coder makes when indexing after the key has been depressed may be objectionable when the unit is considered for agency use.

5. Removal and replacement of the plug-in type component circuits such as the high voltage power supply and high frequency oscillator units will greatly facilitate repair if they are made available as spares. For instance, the high voltage power supply may be removed and replaced in approximately 20 minutes.

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ROUTING AND RECORD SHEET

INSTRUCTIONS: Officer designations should be used in the "TO" column. Under each comment a line should be drawn across sheet and each comment numbered to correspond with the number in the "TO" column. Each officer should initial (check mark insufficient) before further routing. This Routing and Record Sheet should be returned to Registry.

FROM: Research & Development Laboratory

NO. 84-1762

DATE 24 June 1954

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TO	ROOM NO.	DATE		OFFICER'S INITIALS	COMMENTS
		REC'D	FWD'D		
1. R&D Attn: [redacted]	2602 Alcott		15 Jun		Per your request [redacted]
2. OGE			7/16 7/19		A little light reading on [redacted]
3. [redacted] R+D					Very good. Would like similar write up for [redacted]
5. [redacted]					This must be classified U.S. Eyes Only [redacted]
6. [redacted]					
7. [redacted]					
8. [redacted]					
10. [redacted]					
11. [redacted]					
12. [redacted]					
13. [redacted]					
14. [redacted]					
15. [redacted]					

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